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Editorial

To know the exact prevalence and prognosis of atrial fibrillation from a clinical survey—Comments on the "The Fushimi AF Registry"

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Atrial fibrillation (AF) has a rich history. Probably the earliest description of chaotic irregularity of the pulse is Chinese, in The Yellow Emperors Classic of Internal Medicine. In recorded history, William Harvey reported "auricular fibrillation" of animals in 1628. Owing to the invention of the electrocardiogram by Willem Einthoven in 1903, Sir Thomas Lewis recorded clear f waves of AF and established it as a clinical entity. During the past 100 years, there has been an explosion of research into various fields of the mechanisms (ectopic focus vs. re-entry) and treatments (rhythm vs. rate control, antiarrhythmic agents vs. catheter ablation, antiplatelet vs. anticoagulation). Now, the focus of treatments of AF is shifting to improve quality of life and prognosis of AF patients. After 50 years' monopoly of a vitamin K antagonist, warfarin, novel oral anticoagulants are on the market now. For the evaluation of these new drugs, we need basic information on the prevalence and incidence of AF.

Prevalence and incidence of AF vary among different ethnic groups, socio-economic statuses, genders, ages, underlying heart diseases, and many other factors. Although the prevalence of AF in Japan is well known to be lower than in the USA and Europe, it has been increasing with the progress in aging of our society. The management of AF is problematic due to the lack of proper assessment of drugs and tools based on epidemiological surveys. For appropriate management of patients with AF, we need ideally national survey systems on prevalence and incidence of cardiovascular diseases or the accumulation of knowledge on population- and clinical-based studies at the very least. In this editorial, mainly the etiological studies from Japan will be introduced.

Population- or community-based studies

In population-based studies, the prevalence and incidence of AF closer reflect the characteristics of the general population in Japan (Table 1). The incidence of AF was reported from an early cohort of the Hisayama study between 1961 and 1983 [1]. The overall incidence was 4 per 1000 person-years in men, 2 in women. The incidence of AF increased with age in both men and women [1]. Kitamura et al. conducted the cohort study of 6057 residents in a rural area of Akita from 1963 to 1987 and reported an incidence of 1.4% overall, 2.1% in men, and 0.8% in women [2]. The Radiation Effects Research Foundation conducted a longitudinal cohort study from 1968 to1986, in which a total of 6990 subjects were followed biannually [3]. The incidence of AF was about 0.2% in those aged in their 40s and early 50s, and increased to 0.6% in the late 50s, and then increased almost linearly up to 2.5% in the end of the 80s. In the National Survey on Cardiovascular Diseases in 1980, 1990, and 2000, the prevalence increased along with age and was greater in men than in women, but no significant increase in the age-adjusted prevalence of AF was observed during 1980–2000 [4]. In an observational cohort study based on an annual health check-up program for 28,449 participants aged 20 years or older in Niigata from 1996 to 2005, the incidence of AF per 1000 person-years was 4.1 in men and 1.3 in women [5]. In 2003, a large population-based study conducted with the support of the Japanese Society of Circulation included 630,138 participants aged 40 years or older [6]. These data were obtained from periodic health check-ups of community residents, employees, and local governments all over Japan in 2003. The prevalence of AF in the elderly participants was higher than that in younger adults (4.4% for men and 2.2% for women aged 80 years or older vs. 0.8% and 0.1% for those aged in their 50s). The prevalence of AF was consistently higher in men than in women among all age groups, with an overall rate of 1.35% in men and 0.43% in women. Based on the Japanese Registry of Residents in 2005 by the Ministry of Internal Affairs and Communications Japan, the overall prevalence of AF in Japan was estimated to be 0.56% in 2005 [6]. In Kurashiki-city, a community-based study was also conducted in 2006 and included a total of 41,436 residents aged 40 years or older, the observed rate of AF was 0.5% in men and 0.2% in women aged 40–59 years, 2.3% in men and 1.0% in women aged 60–79 years, and 3.5% in men and 2.5% in women over 80 years, and the overall prevalence was 1.6% [7]. Follow-up of this study was conducted until 2007 with 30,010 participants aged 40 years or older [8]. As the result, the incidence of AF per 1000 person-years was 9.3 overall.

Hospital-based epidemiological studies

Several hospital-based surveillance studies on AF also reported different prevalences according to the characteristics of participating hospitals or clinics, their locality, age structure of the subjects, and other factors (Table 2). Most of the previous reports were from emergency hospitals, specialized cardiovascular hospitals,

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Table 1
Population-based studies.

	[References]							
	Hisayama study [1]	Akita study [2]	Nagasaki study [3]	National Survey on Cardiovasc. Dis. [4]	Niigata study [5]	Jap. Soc. Circulation [6]	Kurashiki study (1) [7]	Kurashiki study (2) [8]
Study period	1961–1983	1963–1987	1968–1986	1980, 1990, 2000	1996–2005	2003	2006	2006–2007
Publication year	1998	1991	1989	2005	2008	2009	2008	2010
No. of subjects	1610	6057	6990	23,713	28,449	630,138	41,436	30,010
M/W	–	–	–	10,042/13,671	9805/18,644	295,252/334,886	13,963/27,473	9874/20,136
Prevalence of AF								
Overall (%)	–	1.4	40s–50s: 0.2% 60s: 0.5% 80s: 2.5%	50s: 0.6, 0.4, 0.6 >70s: 3.1, 2.9, 2.7	–	50s: 0.4 70s: 2.1 >80: 3.2	40–59: 0.2 60–79:1.5 >80: 2.8 All: 1.6	–
Men (%)	–	2.1	–	50s: 0.8, 0.8, 0.4 >70s: 3.7, 4.3, 3.5	–	50s: 0.78 70s: 3.44 >80: 4.4	40–59: 0.5 60–79: 2.3 >80: 3.5 All: 2.4	–
Women (%)	–	0.8	–	50s: 0.5, 0.1, 0.7 >70s: 2.6, 1.9, 2.1	–	50s: 0.12 70s: 1.12 >80: 2.2	40–59: 0.2 60–79: 1.0 >80: 2.5 All: 1.2	–
Incidence of AF								
Overall/1000 person-years	–	–	–	–	–	–	–	9.3
Men/1000 person-years	4	–	–	–	4.1	–	–	–
Women/1000 person-years	2	–	–	–	1.3	–	–	–

and general hospitals. Atarashi et al. reported the prevalence of AF at a general hospital in an urban area as being 2.5% from 5079 consecutive patients in 1983. The prevalence of AF was higher in men than in women (2.7% and 2.3%, respectively) [9]. In a community clinic of rural area of northern Kyoto where the aging of the population has been advancing, the prevalence of AF was 8.0% [10]. On the other hand, the prevalence rates reported from specialized cardiovascular hospitals were higher than that of the former general hospital and local community clinics (13.4% from the Hokkaido Atrial Fibrillation Study Group and 11.8% from the Shinken Database 2004) [11,12].

Clinical multicenter study on AF

The J-RHYTHM Registry is conducted as a multicenter prospective study on the present status of AF and optimal anticoagulation treatment [13]. The 158 participating institutions consisted of mainly university hospitals and specific cardiovascular centers. Registration was conducted from 2007 to 2009, and 7937 patients with AF (5468 men and 2469 women) were registered. Of them, 34.2% were over the age of 75 years. Overall, 87.3% of patients were taking warfarin and the underlying cardiovascular diseases were mainly hypertension (59.1% of the patients).

In the present issue of the Journal, Akao et al. present their results of the Fushimi registry that was carried out by the medical institutions in the southern end of the city of Kyoto [14]. A total of 76 institutions including not only specialized cardiovascular institutions but also private clinics took part in the survey research project. Private clinics are definitely at the first line of diagnosis of AF because the vast majority of patients visit them as their family doctors. It is worthwhile to have private clinicians take part in this kind of project not only because the data collected by them will most likely reflect the real prevalence of AF in Japan but also because private practitioners will play more important roles in the coming years that we expect more AF patients to be treated.

This study showed accumulated clinical aspects of AF patients in the particular district. Some of their results were compatible with what the previous studies revealed, and others were different as the

Table 2
Hospital-based epidemiological studies.

	General hospital	Community clinic	Cardiovascular hospitals	
[References]	Atarashi et al. [9]	Imanaka [10]	Hokkaido study [11]	Shinken database 2004 [12]
Study period	1983	2007–2007	1995	2004
Publication year	1986	2008	2000	2008
No. of subjects	5079	550	19,825	2412
M/W	2546/2533	–	1659/1008	–
Prevalence of AF				
Overall (%)	2.5	8.0	13.4	11.8
Men (%)	2.7	2.9	8.4	–
Women (%)	2.3	5.1	5.1	–
Incidence of AF				
Overall/1000 person-years	–	3.8	–	–
Men/1000 person-years	–	–	–	–
Women/1000 person-years	–	–	–	–

authors stated that the Fushimi AF patients were older, had higher risk profiles with more co-morbidities, but received warfarin prescriptions at a lower rate than those in the J-RHYTHM registry study. Those differences are important to know in daily practice since the so-called "standard care or treatment" should be adjusted or modified according to the individual patient who receives the benefit.

The Fushimi AF Registry provided a unique snapshot of current AF management in an urban community in Japan. What the authors elucidated would apply to many clinical scenes at daily practices in Japan. However, the uniqueness suggests to us a picture of where we stand in the management of AF and also indicates the challenging problems to be solved in the coming years.

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